

CLAIMS

What is claimed is:

1. A system for providing audio information to persons in an approach path, comprising:
 - a. an interaction point;
 - b. an approach path, leading to the interaction point; and
 - c. a parametric sound system, including a parametric speaker disposed adjacent to the interaction point, the parametric sound system being configured for limited delivery of sound in a spatially limited audio zone along the approach path and within a decibel level above ambient noise levels in the area of the interaction point, and sufficiently high to be heard primarily by a person progressing along the approach path.
2. A system in accordance with claim 1, wherein the interaction point is selected from the group consisting of a point of decision, a point of selection, a point of transaction, a point of inquiry, and a point of purchase.
3. A system in accordance with claim 1, wherein the decibel level of the audible sound is above about 75 dB.
4. A system in accordance with claim 1, further comprising a detection device, configured to detect the presence of a person entering the approach path.
5. A system in accordance with claim 1, further comprising a controller, for controlling the parametric sound system, and an input device, configured to allow input from a person to the control system.
6. A system in accordance with claim 1, further comprising a controller, for controlling the parametric sound system, configured to receive an audio signal and combine the audio signal with an ultra-sonic carrier wave, and to cause the parametric speaker to broadcast the combined audio signal and carrier wave.
7. A system in accordance with claim 1, further comprising further comprising a visual display, coupled to the parametric sound system, viewable by a person

within the approach path, the system being configured to broadcast audio information corresponding to the output of the visual display.

- 5 8. A system in accordance with claim 7, wherein the interaction point comprises a cashier station, the approach path comprises a customer waiting line adjacent to the cashier station, and the parametric sound system and video display are disposed between the customer waiting line and the cashier station, such that a person at the cashier station is substantially outside the audio zone.
- 10 9. A system in accordance with claim 8, further comprising a null zone, encompassing the cashier station, such that sound from the parametric sound system is substantially inaudible to the person at the cashier station.
- 15 10. A system in accordance with claim 1, further comprising a null zone, encompassing a region outside the audio zone, wherein sound from the parametric sound system is substantially inaudible.
- 20 11. A system in accordance with claim 1, wherein the parametric sound system comprises a plurality of parametric speakers, configured to broadcast sound to a substantially linear audio zone from a position substantially off a linear axis of the audio zone.
- 25 12. A system in accordance with claim 1, wherein the parametric sound system is configured to broadcast sound to cover an audio zone of asymmetric configuration.
- 30 13. A system in accordance with claim 12, wherein the parametric sound system comprises a plurality of parametric speakers, configured to cover the asymmetric audio zone.
14. A system in accordance with claim 12, wherein the parametric sound system comprises a parametric speaker having a curved emitter surface, configured to broadcast sound to cover the asymmetric audio zone.

15. A system in accordance with claim 12, wherein the parametric sound system comprises a parametric speaker having beam steering components, such that a single speaker can cover the asymmetric audio zone.

16. A system in accordance with claim 1, wherein the parametric sound system is configured to focus ultra-sonic energy substantially along a line in the audio zone, so that a relative amount of parametric activity at any location along the line dissipates at approximately a rate of dissipation of sound as distance from the speaker increases.

17. A system in accordance with claim 1, further comprising interconnection to a network, such that the system broadcasts audio information that is common to a plurality of additional audio information systems that are interconnected to the network in a plurality of locations.

18. A system in accordance with claim 1, further comprising a plurality of audio information systems in close proximity to the system, each audio information system being configured to broadcast audio information within a unique approach path, such that the sound broadcast by each system is substantially limited to the unique approach path associated therewith, and is substantially inaudible to persons in adjacent approach paths.

19. A system in accordance with claim 18, wherein each audio information system includes a controller, for controlling the parametric sound system, configured to receive an audio signal and combine the audio signal with an ultra-sonic carrier wave, and to broadcast the combined audio signal and carrier wave via the parametric speaker.

20. A system for protecting persons from undesired sound, comprising a parametric speaker, configured to produce an audio zone wherein sound from the parametric speaker is audible, and to produce a null zone wherein sound from the parametric speaker is substantially inaudible, the null zone being configured to substantially protect persons in the null zone from sound from the parametric speaker.

- 5 21. A system in accordance with claim 20, wherein the parametric speaker is configured to broadcast sound along an axis of propagation that is substantially coincident with an approach path of persons toward a point of transaction.
22. A system in accordance with claim 20, wherein the null zone is configured to substantially cover a personnel location.
- 10 23. A system in accordance with claim 22, wherein the personnel location is selected from the group consisting of a point of inquiry, a point of decision, a point of selection, a point of transaction, and a point of purchase.
- 15 24. A method for protecting persons in a localized area from undesired sound, comprising the steps of:
- a. orienting a parametric speaker to selectively produce sound along an axis so as to create an audio zone and a null zone; and
 - b. manipulating the null zone to cover a localized area, and to protect persons in the localized area from sound from the parametric speaker.
- 20 25. A method in accordance with claim 24, further comprising the step of placing a person in the localized area.
- 25 26. A method in accordance with claim 24, wherein the localized area is selected from the group consisting of a point of inquiry, a point of decision, a point of selection, a point of transaction, and a point of purchase.
- 30 27. A method for maintaining a substantially constant sound level along an audio path, comprising the step of broadcasting sufficient ultra-sonic energy along a path using a parametric speaker so that a relative level of parametric activity along the path dissipates approximately at a rate of dissipation of sound as distance from the speaker increases.

28. A method in accordance with claim 27, further comprising the step of correlating an amount of convergence of ultra-sonic energy along the audio path with a rate of dissipation of ultrasonic energy along the audio path, so as to define a plurality of sound focal points along the audio path.

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29. A method for processing customers at a point of purchase, comprising the steps of:

- a. providing an approach path for customers to move toward a cashier station;
- 10 b. positioning a display screen at the cashier station with a viewing orientation projected along the approach path;
- c. coupling a parametric sound system including a parametric speaker to the display screen, for processing audio sound corresponding to video data displayed on the display screen; and
- 15 d. configuring the parametric speaker for limited delivery of sound projection along the approach path and within a decibel level above ambient noise levels in the area of the cashier station and sufficiently high to be heard by a customer progressing along the approach path.

- 20 30. A method as defined in claim 29, further comprising the steps of:
- a. positioning the display screen between a cashier at the cashier station and the customer; and
 - b. reducing propagation of sound toward the cashier.